ENGINEERING ABSTRACTS

MOTORLESS AIRCRAFT

A society of recent organization, the National Glider Association has set aside the week of November 18 to be observed by gliding clubs and enthusiasts. Eighteen clubs in the United States and many in foreign countries have been active during the past year and expect to participate.

Karl Betts, who has taken over responsibility for arrangements for the week, desires to have men prominent in aviation circles to deliver talks and give public demonstration wherever feasible.

According to Mr. Betts, one who desires to be successful in gliding must be thoroughly acquainted with the principles of flight and a knowledge of their application.—*Aviation.*

AN ECHO ALTIMETER

Professor Leo P. Delasasso, of the University of California, is the author of an attempt to solve the problem of finding altitude while in flight.

To this end Professor Delasasso made several hundred flights in different types of aircraft. He carefully analyzed and charted the different frequency bands so that his chart contained a composite of noise vibrations inherent in modern aircraft.

The theory on which he is working is one which is being utilized by the United States Government to find the depth of the ocean. A sound origination on the instrument panel would be reflected back from the ground or other obstruction over which the plane may be passing. By determining the time lapse between the origin of the sound and its echo, a fairly accurate conception of the altitude might be obtained.—*Aviation.*

EFFECT OF WIND ON FLIGHT

One of the interesting problems confronting beginning air students is the distance that can be flown to a point and back with a constant headwind.

One of the causes of catastrophies is such logic as: "I have gas sufficient to go seven hundred miles. In order to gain experience flying over water I will go out three hundred miles and back three hundred, leaving a safety factor of one hundred miles. Although there is a forty-mile wind blowing off shore it will help one way and hinder the other and its net effect would be zero. The result of such an attempt would be to run out of gas while at sea.

Since less time is required in going a given distance with the wind, the gain will not compensate for the loss while going against it. This is due to the fact that the wind effect on the plane is due to the time it acts and not the distance covered.

—*Aeronautics.*

ITALY'S SCHNEIDER CUP ENTRY

One of the most interesting developments in aircraft construction created for the recent Schneider Trophy Contest was an Italian twin engined Savoia Marchetti fitted with two Isotta Fraschini engines.

In many ways it represents a departure from conventional design. The crankcase of the en-

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gines has been mounted to produce a steamlike effect, and is its own engine bearer. Although the propeller shaft was made abnormally long, reduction gearing was not resorted to. On either side of the cockpit were radiators used as oil reservoirs. This gave a rather cramped construction to the cockpit. The usual rocking bar was replaced by sliding pedals, a change made necessary by restricted space. The control column had to be made slightly curved in shape.

The plane was equipped with twin floats, but in design the underside of each was so curved that if each were continued they would meet under the center line of the ship. It was hoped that their water resistance and action would be the same as that of a large single float. There was no means of proving this theory, however. Upon the inside of each float a small metal deflector was attached to throw the water down from the rear airscrew.

Each engine is said to be able to develop 1750 h.p., but as no speed tests were made, many experts think that some radical changes in the design of the cooling apparatus of both oil and water systems will be necessary.—*Aviation.*

ABSTRACTS

PRESERVING MILK BY FREEZING

As results of experiments made in France by Henri Corblin, milk can now be preserved for many days by a quick freezing process. The ordinary freezing process is too slow; besides, the several constituents, e.g., butter-fat, lactose, casein,

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etc., become separated when thawed. Corblin's process is of such a nature that the thawed milk cannot be distinguished from the initial milk. The milk, while still warm, is put into the cylindrical cans used for shipping and dipped at once for a period of fifteen minutes in a tank of well-agitated cold brine; during which time the milk becomes chilled to about 32° and about one-half inch at the periphery of each can freezes solid. The cans are then dipped into cold water to remove the brine so as to prevent rusting. Following this they are conveyed to a storage room where the temperature is constantly 30°F. The milk will keep perfectly for twenty days, which is longer than commercial requirements.—*Refrigerating World.*

DO YOU KNOW THAT:

The first skyscraper in eastern Europe will be built in Budapest? It will be eighteen stories high and will house the State Institute for Social Insurance.

Synthetic sapphires can no longer be passed off as genuine, because it has been found that a cathode ray is capable of distinguishing the imitation from the natural stones. When exposed for a few seconds to the powerful rays given off by the Coolidge tube, the artificial and but one kind of the genuine sapphires will glow as if molten, but as soon as the ray is turned off, the precious gems lose their glow while those of man's making continue for some time to resemble live coals.—*Compressed Air.*

A charred loop of sewing thread was the corner-stone of the electric light and power industry whose invested capital is more than $8,000,000,000. Thomas A. Edison devised the first commercial practicable electric incandescent lamp by using for a filament a loop of carbonized thread. That was fifty years ago. If all of the large incandescent bulbs sold during last year were hung over New York City and switched on after dark the resulting brilliancy would equal several times the glare of the noon-day sun, and again, if those lights were arranged so that they would glow over the whole expanse of the United States after nightfall, the illumination would be such that we could plainly see our way, no matter how black the night. Thus we can now comprehend the way that Edison has blazed with that charred thread of half a century ago.—*Compressed Air.*

The British Airship R101 was constructed experimentally. The design of her hull is a complete departure from that of previous airships. The frame work is built of high tensile and stainless steel rather than aluminum alloy. Even the motors are different, they are of a heavy oil type. Every outstanding feature design had been the subject of research and test before the work proceeded.—*London Engineer.*

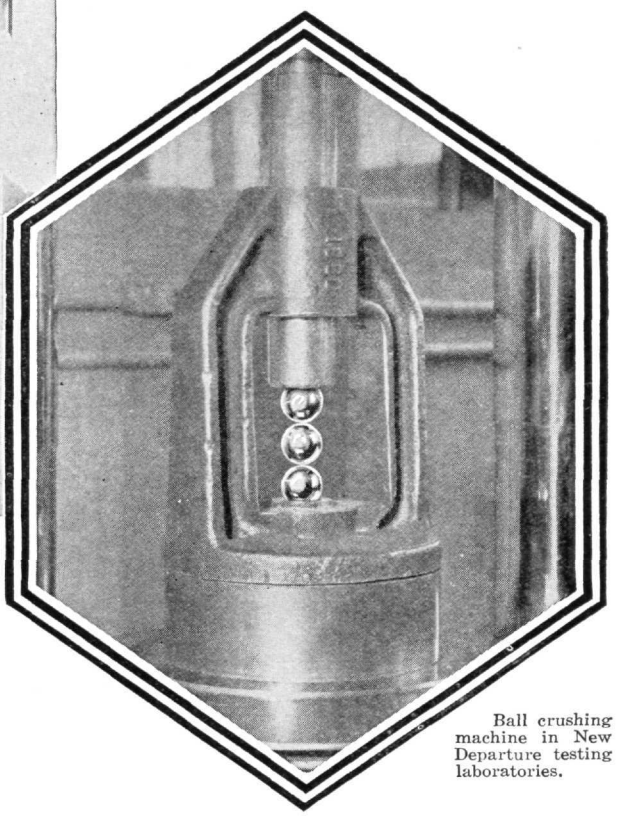
ALWAYS IN TRAINING

"Motoring is surely a great thing. I used to be fat and sluggish before the motoring craze, but now I'm spry and energetic."

"I didn't know you motored."

"I don't. I dodge."—*Montreal Star.*

Nature's Strongest Form



Ball crushing machine in New Departure testing laboratories.

Do You Realize Just How Strong a Ball is?

TO determine more easily the strength of steel balls used in New Departure Ball Bearings it has been found necessary to stress the balls under extremely severe conditions.

The balls are placed "three-in-line" to obtain minimum contact areas.

On a one-inch ball the testing machine imposes a unit pressure of *a million and a quarter pounds per square inch* before the crushing load is reached!

Note, however, that under normal bearing loads close-curvature raceways reduce this unit stress approximately 420 percent and greatly increase resisting capacity.

Add to this enormous strength the fact that the friction-coefficient of a steel ball traveling under heavy load is practically no greater than that of starting . . . and you have some of the reasons why New Departure Ball Bearings are so often selected wherever utmost efficiency and endurance are prime considerations.

The New Departure Manufacturing Company, Main Office and Works, Bristol, Connecticut; Detroit, Chicago and San Francisco.

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